

Integrated sputter target assembly

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A large plate assembly (77; 124; 213) completely covers and seals against a top opening of a sputtering processing chamber (69; 138). Cooling liquid connections are provided only from the perimeter of the target assembly (77; 114, 213). When a top vacuum chamber (109; 114) seals the side opposite the pressure chamber (69; 138), the pressure on both sides of the target assembly (77; 114; 213) is nearly equalized. Large thin target assemblies, such as large flat plates used for flat panel displays can be sputtered effectively and uniformly without adverse sputtering effects due to target deflection or cooling deficiencies. A target (79; 127; 181), target backing plate (80; 128; 171), and cover plate (95; 125; 126; 197) may form a target assembly (77; 124; 213). The sputtering target assembly (77; 124; 213) includes an integral cooling passage. A series of grooves (70; 96; 149; 172) are constructed in either the target backing plate (80; 128; 171) or the target backing cooling cover plate (95; 125; 126; 197), which are then securely bonded to one another. The sputtering target (79; 127; 181) can be a single monolith with a target backing plate (80; 128; 171) or can be securely attached to the target backing plate (80; 128; 171) by one of any number of conventional bonding methods. Tantalum to titanium, titanium to titanium and aluminum to titanium, diffusion bonding can be used. The energized target assembly is protected from adjacent components by overlapping insulators (117, 134; 210, 216, 133) to prevent accidents and isolate the target assembly from other components. An electrical connection to the target assembly (77; 124; 213) remains unconnected until a vacuum is produced in the top chamber (109; 114).

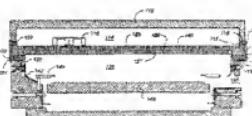


Fig. 37

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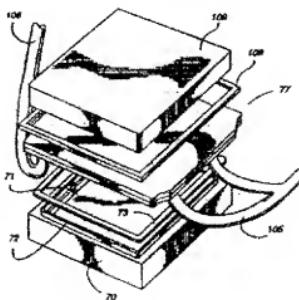
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[54]发明名称 集成式溅射靶组合件

[57]摘要

靶组合件由靶材、靶支撑板及盖板构成，它含有一整体式的冷却通道。在支撑板或盖板上事先开有若干沟槽，再将之牢固结合；冷却液接头又只布置在其周界处，从而消除了该液漏入并污染处理室及工作的危险。组合件的下方封住了处理室，上方封住了内放扫动磁铁的并抽成真空的顶室，由于该件两侧压强已大致相同，纵使其形大而薄（被平板显示器时需用），镀层仍能均匀，靶材利用率亦高，消除了因靶材弯曲或冷却不足而带来的不利影响。



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